CHAPTER

9

Water Management Assistance Program

9.1 INTRODUCTION

The Arizona Department of Water Resources' (Department) Water Management Assistance Program (WMAP) is intended to provide financial and technical resources to assist water users in meeting their conservation requirements, facilitate renewable water supply utilization, and obtain information on hydrologic conditions and water availability in the Active Management Area (AMA). This program is funded primarily through a portion of the groundwater withdrawal fees paid annually by persons withdrawing groundwater in the AMA. The WMAP consists of the following: the Conservation Assistance Program, the Augmentation Assistance Program, and the Monitoring and Assessment Program. Conservation and augmentation assistance, and information on hydrologic conditions acquired through monitoring and assessing water availability, are essential tools in achieving the Department's water management goals. These goals include the efficient use of all water supplies and meeting the AMA safe-yield goal.

Conservation assistance is provided primarily in the form of financial assistance. However, it also includes planning and technical support and information and education services. Conservation assistance will continue to serve as a balance to enforcement actions during the third management period.

Augmentation assistance involves providing funds for projects that supplement the water supply of the AMA or that provide information to resolve technical feasibility issues or to optimize operation of recharge projects. Assistance includes studies initiated or conducted by the Department, cost sharing grants for augmentation projects, and studies initiated or conducted by others. Assistance may also include planning and technical support for AMA-wide and local area water management strategies.

Monitoring and assessment activities include providing staff assistance and funds for water supply and subsidence monitoring studies.

This chapter includes the following sections:

- Statutory Provisions
- Department's Role in the Water Management Assistance Program
- Second Management Plan Program Summary and Assessment
- Third Management Plan Program Goals and Objectives
- Allocation of Program Funds
- Future Program Direction

9.2 STATUTORY PROVISIONS

9.2.1 Program Authorization and Funding

The Groundwater Code (Code) requires that the Third Management Plan include a program for "additional augmentation of the water supply of the active management area, if feasible, including incentives for artificial groundwater recharge" and "a program for conservation assistance to water users within the active management area." A.R.S. § 45-566(A)(6) and (8). Funding for these programs comes primarily from groundwater withdrawal fees levied and collected pursuant to A.R.S. § 45-611(C). Other sources of funding include one-half of the annual surcharge collected by the director from persons holding a permit for interim groundwater use in bodies of water within the AMA and application fees for underground

storage facility permits, groundwater savings facility permits, water storage permits, and recovery well permits. A.R.S. §§ 45-133(E) and 45-871.01(A).

All fees received by the Department for the WMAP must be transmitted to the state treasurer. A.R.S. § 45-615. The state treasurer is required to hold the fees in a separate fund, and to maintain within the fund, separate accounts for each AMA. A.R.S. § 45-615(1). Monies held in the fund for an AMA may be used only to finance the augmentation and conservation assistance programs that are part of the management plan for the AMA, and to fund any projects that are authorized by the director for monitoring and assessing water availability within the AMA. A.R.S. § 45-613(A).

The director is authorized to provide monies from the fund, through grants rather than through the state's Procurement Code, for augmentation or conservation assistance projects that will benefit the AMA in which the monies were collected. A.R.S. § 45-617. However, the director has no authority to grant monies from the fund for monitoring and assessing water availability. Thus, if the Department elects to contract with an outside party to perform work on a monitoring project, the Department must either comply with the Procurement Code or enter into an intergovernmental agreement (IGA) with another governmental entity.

9.2.2 Groundwater Withdrawal Fees

The groundwater withdrawal fee is levied and collected from each person who withdraws groundwater from a non-exempt well within the AMA, except persons who withdraw groundwater for use on a farm with ten or fewer irrigation acres. No later than October 1 of each year, the director is required to set the groundwater withdrawal fee for an AMA for the following year. A.R.S. § 45-614(A). Prior to setting the fee, the Groundwater Users Advisory Council (GUAC) for the AMA recommends to the director how the fee should be set within the statutory limit.

Within 30 days after setting the fee, the director is required to give written notice of the fee to all counties, cities, towns, private water companies, political subdivisions, and holders of groundwater withdrawal permits in the AMA. A.R.S. § 45-614(C). The fee is required to be paid to the Department at the time the person withdrawing the water files an annual report pursuant to A.R.S. § 45-632. A.R.S. § 45-614(E).

Groundwater withdrawal fees for administration and enforcement of the Code have been collected since 1984. The Tucson AMA began levying an augmentation fee in 1986 as authorized in a 1984 amendment to the Code and for conservation assistance in 1991 through a 1990 Code amendment. Prior to 1996, up to $2.00 per acre-foot could be collected for augmentation and conservation assistance programs. The Legislature amended the Code in 1996 to provide that a portion of the fee could also be used for monitoring and assessing water availability in the AMA. A.R.S. § 45-611(A)(2). Also in 1996, the Legislature reduced the maximum amount that could be collected for WMAP purposes to $.50 per acre-foot, while providing for $2.50 per acre-foot to be collected to support the activities of the Arizona Water Banking Authority (AWBA). In 2017, the fee for Arizona water banking purposes will expire, and the fee for augmentation, conservation assistance, and monitoring and assessing water availability will revert to a maximum of $2.00 per acre-foot per year. Table 9-1 provides withdrawal fee information in the Tucson AMA since 1984. Total available funding for the programs varies from year to year depending on the amount of groundwater withdrawn and any carry-over of funds from previous years. The total expenditures from these funds are itemized in Appendices 9A and 9B.

TABLE 9-1
ANNUAL WITHDRAWAL FEE SUMMARY
TUCSON ACTIVE MANAGEMENT AREA

Year	Admin/ Enforcement ($/acre-foot)	Augmentation ($/acre-foot)	Conservation Assistance ($/acre-foot)	Legislative Studies ($/acre-foot)	Total ($/acre-foot)
1984	.50				.50
1985	.75				.75
1986	1.00	.50			1.50
1987	1.00	.50			1.50
1988	1.00	.50			1.50
1989	1.00	.50			1.50
1990	1.00	1.00			2.00
1991	1.00	1.50	.25	.15	2.90*
1992	1.00	1.50	.35	.15	3.00*
1993	1.00	1.50	.50	.15	3.15*
1994	1.00	1.50	.50		3.00*
1995**	1.00	2.00			3.00*
1996**	1.00	2.00			3.00*
1997**	2.50 for AWBA	.50			3.00*
1998**	2.50 for AWBA	.50			3.00*

* Water Quality Assurance Revolving Fund (WQARF) money collected from Type 1 and Type 2 grandfathered rights and withdrawal permits for the Arizona Department of Environmental Quality resulted in a total of $5.02 for 1991; $5.12 for 1992; $5.27 for 1993; and $5.12 for 1994, 1995, 1996, 1997, and 1998 for these users.

** In 1995, the Augmentation and Conservation Assistance Funds were combined. In 1996, the law was changed to allow this fund to also be used to monitor and assess water supply availability.
AWBA = Arizona Water Banking Authority

9.3 THE DEPARTMENT'S ROLE IN THE WATER MANAGEMENT ASSISTANCE PROGRAM

The Department's role in the WMAP is to:

- Review and provide input on project proposals
- Develop project proposals
- Implement Department projects
- Prioritize projects that best meet the AMA management objectives
- Provide technical and field assistance
- Provide information and educational services
- Promote the exchange of information among entities implementing the projects
- Administer IGAs, contracts, and grants as described in this chapter

A complete description of how projects are prioritized and selected, and how funds are allocated is found in section 9.6.

9.3.1 Fund Management and Administration

Fund management and administration of grants and contracts are coordinated between the Department's Administrative Services Division and the AMA. The centralized functions include management of the separate funds for each AMA and contract administration. The AMA staff initiate and support the grant application and review process and serve as the technical administrators for most grants and contracts.

9.3.2 Contract Development, Monitoring, and Support

Each applicant proposal accepted for funding must enter into a contractual agreement with the Department. Contracts are prepared by Department staff, consistent with the applicant's proposal and scope development. The contract describes what tasks are to be accomplished and sets deadlines for task completion and fund disbursements. Department staff track progress and review deliverables for compliance with contract requirements. The Department authorizes and issues payments, modifies contracts as needed, and provides other legal and administrative support.

9.3.3 Information and Education Service

The Department's Web site will serve as an information clearinghouse and the primary public venue for dissemination of current information on the WMAP programs. Information gained through Department sponsored programs, which are deemed to be regionally, statewide, and/or nationally transferable, will be placed on the Department's Web site and updated regularly. An additional focus will be linking the Department's Web site to other pertinent Web sites. This will assist users in finding water conservation, water supply, and augmentation information from other sources. In addition to a computer-based information clearinghouse, a centralized clearinghouse could include a library of conservation and augmentation literature as well as detailed information on grants and contracts funded and could provide centralized water conservation outreach activities.

The AMA office is responsible for developing water conservation information materials, educational curricula and displays, and programs specific to water users within the AMA. These materials may be developed independently, with conservation assistance funding (e.g., grants or contractual agreements with consultants), in cooperation with other AMAs, or through partnerships with other government agencies, community groups, or utilities.

The AMA office is also responsible for maintaining inventories of information and educational materials for distribution to water users within the AMA. Conservation-related presentations to schools, civic and other groups, and participation at local events are generally the responsibility of the AMA staff.

9.3.4 Assistance Activities

The Tucson AMA provides direct conservation assistance to individual water users to promote compliance with management plan conservation requirements. Assistance activities may include providing general or specific advice, performing research, assisting in the development of conservation and water management programs, and providing field or other technical support. AMA staff also provide support for augmentation and recharge activities including technical assistance and facilitation of regional planning efforts.

9.4 SECOND MANAGEMENT PLAN PROGRAM SUMMARY AND ASSESSMENT

The fees collected during the second management period were used to fund conservation and augmentation assistance grants and to fund program administration and conservation and augmentation assistance staff in the Tucson AMA. Typically, the Department advertised the availability of funds for grants each year,

evaluated the grant proposals received, and awarded funds to projects that best met the program objectives. Beginning in 1996, a change from the augmentation grant system to a proposal process was initiated as discussed in section 9.4.2.

9.4.1 Second Management Plan Conservation Assistance Program

The following four separate conservation assistance programs were identified for funding in the Second Management Plan: (1) Information and Education Program, (2) Agricultural Users Program, (3) Municipal Users Program, and (4) Industrial Users Program.

By the end of the 1998 conservation grant cycle, the Tucson AMA had funded conservation programs totaling $1,210,101. The program subtotals are shown in Table 9-2. A detailed summary of conservation assistance expenditures can be found in Appendix 9A. The information and education category includes funding for municipal and industrial programs and five years of funding for a water conservation specialist position in the Tucson AMA office to provide administrative and technical support for the Conservation Assistance Program.

TABLE 9-2
CONSERVATION ASSISTANCE GRANTS FUNDED 1992-1998
TUCSON ACTIVE MANAGEMENT AREA

Program	Number of Grants	Expenditures
Information and Education	32	$521,173
Agricultural Users	9	$243,350
Municipal Users	26	$308,134
Industrial Users	12	$137,444
TOTAL	79	$1,210,101

The types of programs funded included:

Information and Education/Youth Education Programs: teacher training and production of a teacher's resource guide; a monthly water education article and program in a regional children's newspaper; a transportable water conservation maze; and groundwater models with accompanying 5-8th grade water conservation curriculum

Information and Education/General Programs: full-time water conservation specialist position in the Tucson AMA office; brochures on water conservation requirements, water harvesting, and conservation design and technology for developers; landscape workshops; interactive educational displays; video and outreach at Casa del Agua; a desert landscaping interactive multimedia CD-ROM; a water conservation booklet and display at the Arizona Sonora Desert Museum; and a regional water supply and demand brochure and video

Agricultural Programs: irrigation scheduling assistance program for farmers; effluent utilization plan development; and a bilingual video on efficient irrigation for agriculture

Municipal Programs: plumbing retrofit, water audit, leak detection, education, and toilet and faucet aerator rebate programs in several service areas; production of a conservation video public service announcement; a regional water supply and demand brochure; installation and monitoring

of waterless urinals; pilot irrigation central controller system; outdoor water use training workshops; analysis of water conservation potential of front loading washing machines; and a landscape irrigation system analyst position to provide recommendations on improving irrigation system efficiency at high water use sites

Industrial Programs: interior and exterior hotel water audits; video and training manual on water conservation techniques for cooling tower operation; submetering and displays at the Arizona Sonoran Desert Museum; feasibility study on Central Arizona Project (CAP) water use by metal mines; subsurface drip irrigation feasibility study; potential for use of high total dissolved solids (TDS) cooling tower blowdown water for plant irrigation; training workshops for turf irrigation; turf irrigation audit and repair program; turf irrigation efficiency study; and development and field testing of a turf overwatering controller

Appendix 9A contains a complete listing of conservation assistance grants funded in the Tucson AMA from 1992 through 1997. In addition, chapters 4, 5, and 6 contain discussions of grants for these sectors in the "Non-Regulatory Efforts" sections. Detailed information on conservation assistance grants is available through the Tucson AMA office, including project final reports. By the year 2000, information should also be available through the Department's website.

9.4.2 Second Management Plan Augmentation Assistance Program

Prior to the establishment of the augmentation grants program, the Tucson AMA initiated the Rillito Recharge Project, a multi-source, multi-agency cooperative project that was expected to be constructed between Craycroft and Swan Roads on the Rillito River. Pima County and the City of Tucson worked jointly with the Department on preparation of a feasibility study, development of the hydrologic database, preliminary design work, and the preparation of a transferable technologies report. The Department's contribution from the augmentation fund was $173,933. Although the project was discontinued in 1992 after the City of Tucson ended its participation, renewed interest in the feasibility of recharge in the Rillito has resulted in an extensive hydrologic modeling effort by the Department and the United States Geological Survey (USGS) to evaluate recharge feasibility and direction of flow.

From 1990 through 1993, augmentation assistance monies totaling $798,190 were used to fund the Santa Cruz Valley Water District, a regional district established through legislation to facilitate access to renewable water supplies (see section 8.4.5.4 of Chapter 8).

During the second management period, the Tucson AMA awarded augmentation grants and contracts totaling approximately $1,347,000 through March 1999. These grants and contracts are summarized below. A more detailed summary of augmentation fund projects and expenditures is found in Appendix 9B. Complete information on augmentation grants is available through the Tucson AMA office, and by the year 2000, should also be available through the Department's website.

- Sahuarita School District Pilot Wetlands Project to treat wastewater generated at the site and serve as an educational resource

- A feasibility study on conversion of a turf irrigation system from groundwater to reclaimed water for 12 Tucson Unified School District sites

- Irrigation ditch improvements at BKW farms to allow for greater volumes of CAP water to be delivered to farms

- Two grants to Metropolitan Domestic Water Improvement District for feasibility studies for recharging CAP water in the Cañada del Oro Wash

- At the request of the Upper Santa Cruz Water Users Group (USCWUG), a study of the feasibility of bringing CAP water from the current CAP terminus to water users in the Green Valley-Sahuarita area

- A contract for a literature search to evaluate selected disinfection by-product issues related to the recharge and recovery of CAP water

- A grant to Pima County for archaeological, geotechnical, geochemical, and hydrogeological feasibility studies of the proposed Lower Santa Cruz Recharge Project and the proposed Cañada del Oro Recharge and Recovery Project to determine the projected long-term geochemical impacts of recharging CAP water and effluent on recharge rates and groundwater quality

- A contract to complete hydrological characterization and technical recharge feasibility assessment of the proposed Cañada del Oro Recharge and Recovery project. A variably saturated flow model of the vadose zone will be used in lieu of a pilot test to evaluate the long-term recharge potential of the site and whether mounding will be significant

- An IGA with the U.S. Geological Survey for a recharge feasibility study of a 12 mile reach of the Rillito River. A model will be developed and used to evaluate several infiltration scenarios to determine the timing and location of recharge and the recharge benefit to Tucson's Central Well Field

Almost $2.5 million was spent on augmentation-related projects and staff in the Tucson AMA since 1987.

9.4.3 Second Management Plan Program for Monitoring and Assessment

In early 1998, the Department worked with the USGS, Pima County, and the City of Tucson to develop a cooperative subsidence and aquifer monitoring program in the Tucson area. The monitoring program has expanded to include the Tucson, Phoenix, and Pinal AMAs. This cooperative effort entails the acquisition of monitoring equipment, development of a research protocol, and ongoing measurement of changes in land surface elevation and aquifer storage.

Changes in the land surface elevation for the Tucson Basin and Avra Valley will be estimated on the basis of repeated Global Positioning System (GPS) surveys. Changes in aquifer storage will be monitored based on microgravity surveys at a network of stations. Differential GPS surveys can be used to monitor changes in vertical position of the land surface with an accuracy of 2 centimeters or better. The GPS and gravity surveys will use an existing network of vertical extensometers and benchmarks, as well as an additional 20 sites that will be added to the network, to obtain representative coverage of the region. Changes measured in gravity readings at the stations over specific time intervals will be integrated across the area to produce a total change in aquifer storage for the network area. The combination of data on land surface changes and aquifer storage will yield valuable information on existing subsidence rates, changes in the ability of the aquifer to store water, and future subsidence potential. This data is needed to make informed water management decisions and to provide inputs for groundwater modeling activities.

The three-year project is funded at a total of $137,000 per year with funds contributed by the Tucson AMA, Tucson Water, and the USGS. Pima County is participating by providing in-kind contributions of equipment and personnel for monitoring activities.

9.4.4 Second Management Plan Program Assessment

The Conservation Assistance Program in the Tucson AMA has been very successful, with virtually all grants resulting in the completion of high quality products or deliverables. Applications have exceeded the

amount of money available every year, the quality of applications has been high, and the selection process has been competitive. As is illustrated by the project summaries in Appendix 9A, the availability of funds has generated innovation and collaboration in the community. Although the quantity of water saved is not measurable for all projects, in some cases (such as the agricultural irrigation conservation assistance program with reported savings of almost 7,500 acre-feet over four years), quantified water savings are directly attributable to grant-related activities.

The augmentation assistance funds have been used for grants, IGAs, contracts with consulting firms, and AMA staffing for contract management and the regional recharge planning process. As with the conservation program, there is a high degree of satisfaction with the assistance that has been provided and the quality of work products. Activities associated with the regional recharge planning process have resulted in the establishment of a regional forum to address the highly politicized issues associated with recharge. (See section 8.4.5.3 of Chapter 8.) Augmentation funds have supported the direct use of CAP water and effluent, helped develop new techniques for assessing recharge feasibility, and addressed water quality management questions related to the operation of recharge facilities.

9.5 THIRD MANAGEMENT PLAN PROGRAM GOALS AND OBJECTIVES

As incoming funds for the WMAP decline as a result of reduction in the amount of the groundwater withdrawal fee that may be levied and reductions in groundwater pumping due to renewable supply use during the third management period, the remaining funds will need to be further focused on projects that provide maximum benefit to the AMA. This section discusses the goals and objectives of each of the Water Management Assistance Programs for the third management period.

9.5.1 Third Management Plan Conservation Assistance Program

Goals of the Conservation Assistance Program for the third management period include the following:

- Increasing efficiency of all water use
- Assisting regulated water users in meeting their conservation requirements
- Maximizing the effectiveness of conservation programs through cooperative activities and transferability of grant products
- Providing outreach activities
- Targeting the water using sectors with the greatest conservation potential
- Funding research in areas where more information is needed

During the third management period, the Department, with input from the GUAC and others, may take a more active role in directing how funds are utilized. This may include compiling a list of projects that need to be funded through requests for proposals (RFP), in addition to or in place of using the current grant-based approach. Assessment of program effectiveness in saving water and transferability of information are particularly important as the monies available for conservation assistance decline. Conservation assistance activities are an integral part of achieving the Tucson AMA safe-yield goal and the Department intends to continue to allocate staff resources for education and assistance efforts.

9.5.2 Third Management Plan Augmentation Assistance Program

The Third Management Plan objectives of the Augmentation Assistance Program are to continue to use augmentation funds for research and planning assistance activities that expedite the utilization of renewable water supplies to replace groundwater use, as well as facilitating regional cooperative efforts. The Augmentation Assistance Program may be more Department directed during the third management period because of reduced funding. The AMA is developing a more site-specific local resource management approach to address concerns about localized negative impacts of groundwater level changes.

The goals and objectives of the Augmentation Program are listed in section 8.6 of the Augmentation Program Chapter.

9.5.3 Third Management Plan Program for Monitoring and Assessment

Understanding hydrologic conditions is integral to water resource planning. The goal of the Third Management Plan Monitoring and Assessment Program is to collect data about hydrologic conditions in the Tucson AMA on an ongoing basis. These data will be used to determine aquifer storage and subsidence impacts, and to support the safe-yield goal through the Department's water management activities and groundwater modeling efforts.

9.6 ALLOCATION OF PROGRAM FUNDS

During the third management period, the director will continue to allocate the WMAP fund between the conservation assistance, augmentation assistance and monitoring programs based on the need to implement particular projects for the benefit of the AMA. The GUAC will initially make a recommendation to the director on how the WMAP funds should be allocated among the three programs. The director will then make the final decision on the allocation.

While funds were reduced for the WMAP in 1997, there was a substantial amount of unspent monies in the original augmentation assistance fund. This allowed for a continued high level of funding for augmentation projects and allowed the incoming monies ($.50 per acre-foot) to be spent on conservation assistance programs. As the monies in the original augmentation assistance fund diminish, the AMA will need to develop an allocation method that provides the greatest cost/benefit to the AMA. This section discusses the types of programs that might be funded, the project selection methodology for each program, and project implementation methods.

9.6.1 Fund Categories

9.6.1.1 Conservation Assistance Program

The following types of conservation assistance could be provided through grants, contracts, or direct staff assistance:

Planning, Research, Feasibility, and Follow-up Studies

- Analyze water savings and water use efficiency potential among water use sectors
- Analyze the effectiveness of individual programs or technologies
- Promote cooperative research efforts between the Department and water users
- Identify future research and implementation needs

Technical Assistance

- Assist users in implementing conservation programs
- Assist users in managing their systems or facilities for maximum efficiency
- Provide information, training, and water use assessments and recommendations
- Perform water use audits
- Develop grant applications and contracts

Information and Education Materials

- Acquire and/or develop information and education materials for distribution at libraries, AMA offices, water utility offices, and throughout the community
- Assist in developing materials that can be used by multiple AMAs whenever appropriate

Conservation Devices and Technology

- Research and promote water efficient plumbing fixtures, appliances, water reuse systems and other technologies (e.g., front loading clothes washers, hot water heater recirculation loops, grey water filtration systems and others as developed)
- Assist local governments to amend or develop ordinances, incentives, and design guidelines to incorporate new water conservation technologies that promote water use reductions or increased water use efficiency

Testing and Monitoring Equipment

- Acquire testing and monitoring equipment for irrigation system analysis, soil moisture probes, leak detectors, or other measuring devices. As appropriate, make the equipment available for use by staff or interested water users.

9.6.1.2 Augmentation Assistance Program

Monies allocated for augmentation assistance will be used for projects that have as their primary goal the increase of water supplies or water storage. The monies may support staff members engaged in augmentation and recharge support activities. The monies may also be used for planning, research, and feasibility studies to help determine what augmentation activities are suitable for future construction and implementation projects. Types of studies could include those designed to assess the feasibility of new technologies, to identify future sites for augmentation projects, to collect data, to resolve institutional issues, and to otherwise facilitate future augmentation activities. The monies may also be used to finance pilot and demonstration projects, construct facilities, and fund other activities that increase water supplies.

9.6.1.3 Monitoring and Assessment Program

The monitoring program may include various activities depending on the types of hydrologic information needed to be gathered or monitored. The following are possible funding categories that could be considered:

Monitoring and Measurement

The Department may fund the purchase of monitoring equipment to measure subsidence, groundwater and surface water flow, recharge and water levels, as well as for use in ongoing monitoring activities of hydrologic conditions in the AMA. This could include providing monies to pay for personnel to conduct measurements, develop reports, and acquire and analyze data.

Research Activities

Research activities could include developing innovative monitoring techniques for aquifer water storage or other hydrologic information, assessing the feasibility of new monitoring technologies, supporting the AMA groundwater modeling efforts, or other research and planning activities related to water availability and subsidence.

9.6.2 Project Selection

While all efforts that lead to conservation and augmentation of water resources are encouraged, the efforts selected to receive WMAP funds depend on many factors. These factors will determine how funds are allocated to: (1) projects in various sectors, (2) the Department for the administration of the programs, and (3) projects initiated by the Department.

The decision-making process for project selection must be flexible. During the third management period, changes may occur in water use patterns, technology, social values, institutional constraints, and the economic viability of conservation or efficiency measures. Due to this potential for change, it is impractical at this time to determine the types of projects that will merit funding in the future. The second management period project selection process has proven flexible as well as politically and publicly responsive. This has been accomplished by full participation of the GUAC. The GUAC's regularly scheduled meetings provide an excellent forum for public review and comment on projects and proposals. Joint GUAC meetings, which involve the GUACs from all the AMAs, can also provide an opportunity to discuss changing circumstances or priorities. This process will be continued for the third management period.

In 1996, the Tucson AMA initiated an augmentation contract process to supplement the grant system. The purpose of the change was to focus on priority projects that target prominent regional recharge needs, and to make strategic use of dwindling augmentation program funds. Although the amount of the fee levied to fund the Augmentation and Conservation Assistance Program was significantly reduced by the 1996 legislation that created the AWBA, the balance remaining in the original augmentation account is available to fund augmentation projects. To simplify the procurement process and shorten the delay in contracting for technical expertise, the Tucson AMA developed a general technical services contract through the Arizona Department of Administration. The Department and the AWBA anticipate using this contract for a wide range of augmentation and recharge feasibility-related projects.

If the Department determines that grants will be available in a given funding cycle, it will then provide notice to water users and other interested parties of the procedures that will be used for soliciting grant project proposals. The Department may also submit its own projects for consideration. The evaluation criteria that will be used by the GUAC and the director in selecting projects to be funded will be determined prior to commencing the selection process. Using the evaluation criteria below and others selected by the GUAC, the proposals will be reviewed by AMA staff, the GUAC, and outside reviewers as appropriate. The GUAC will then recommend projects to the director for funding. If the GUAC recommends a project proposed by the Department, the GUAC may also recommend whether the project should be implemented by the Department or another entity, based on an evaluation of efficiency, effectiveness and short-term and long-term benefits to the AMA. The director will make the final decision on what projects to fund.

9.6.2.1 Conservation Assistance Proposal Selection Criteria

The selection criteria to be used in the Tucson AMA by the GUAC and the director to evaluate conservation assistance proposals are listed below. Certain criteria may be given greater weight, and any weighted system will be applied consistently to each application. There are three mandatory evaluation criteria and additional criteria that may be used in project selection.

Mandatory Evaluation Selection Criteria

1. Compliance of the project with applicable laws and administrative regulations. In the case of regulated water users, the extent to which this project helps to reach Third Management Plan conservation requirements.

2. Cost effectiveness of the project. Ability to combine the project with proposed or ongoing projects resulting in cost and human resource savings. Ability of the applicant to obtain matching funds for the project. Extent to which the applicant is contributing to the cost of the project (e.g., in-kind or cash). Predicted water demand reduction - extent and duration of reduction relative to project costs.

3. Compatibility of the project with the Department's policies and programs and the management goal of the Tucson AMA.

Additional Evaluation Selection Criteria

4. Extent to which the type of project is applicable to other users, other sectors, and other AMAs.

5. Likelihood of community support for the project. Demonstrated sector commitment to participate in the project.

6. Significance of the project's potential economic, environmental, and social impacts.

7. Extent to which the type of project has previously been proven feasible and effective, or extent to which implementation of the project will provide information on feasibility and effectiveness if not previously proven.

8. Demonstrated need–is it likely the project would not be implemented without conservation assistance funding?

9. Ability to monitor demand reductions during and after implementation of the project. Ability to produce documented comparisons of pre- and post-project water savings, scientific data collection and reporting methods, or pre- and post-program surveys to verify project results.

10. Past performance of the applicant with regard to implementing conservation projects. Whether the applicant has experience and past successes with similar projects.

11. Effectiveness of proposal–includes factors such as a clear statement of purpose, goals, methodology, and list of deliverables (data collection, interim and final reports, etc.). Contains background on current and historic water use if applicable. Whether the proposal is innovative and includes sufficiently researched budget information to determine if the requested funding amount is warranted (e.g., salary costs and benefits, retrofit device costs, equipment purchases, and supplies).

Special Preference Points

The director may choose to give special preference points to certain sectors or types of projects prior to the initiation of the grant process. These special categories may change from year to year. For example, preference points may be given for projects that result in measurable water savings, involve technology transfer and/or cooperative efforts, or that involve cost sharing between water providers or regulated water users.

9.6.2.2 Augmentation Assistance Proposal Project Selection

Each augmentation assistance project grant proposal will be evaluated according to the criteria established by the director in consultation with the GUAC. Evaluation criteria may include, but are not limited to the following:

- Compatibility with current Department programs and policies, and consistency with the management goal of the Tucson AMA
- Significance of the project's potential economic, environmental, and social impacts
- Compliance with applicable federal, state, and local regulations
- Technical feasibility and timely realization of alternative renewable water supplies
- Promotion of efficient use of the alternative water supplies
- Potential to contribute to regional water management solutions
- Likelihood of developing transferable information
- Capability of the applicant to successfully implement the project
- The potential to contribute to critical area management solutions

Augmentation projects and proposals other than grants may be initiated at any time by the Department at the request of the GUAC, a public or private entity, or at the Department's own initiative. The GUAC and Department staff will analyze these proposals for consistency with the AMA's augmentation assistance objectives and the evaluation criteria, as applicable. The director will make the final decision on whether to fund a proposal.

The Department may coordinate with other agencies and organizations involved in water quality regulation and issues, in addition to the Arizona Department of Environmental Quality, through a review and comment process or other means, to ensure that these agencies and organizations are aware of the proposed project and are allowed time to assess any impact the proposed project may have.

9.6.2.3 Monitoring and Assessment Project Selection

Monitoring projects will likely be developed in cooperation with other government agencies or educational institutions through an IGA or will be initiated by the Department and funded through RFPs. There is no statutory provision that authorizes the director to grant monies for monitoring and assessing water availability, unless it is tied to augmentation. Thus, the Department must comply with the Procurement Code if the Department contracts with a private entity to conduct monitoring. Project development and selection will be based on the AMA's monitoring and assessment needs in consultation with the GUAC.

9.6.3 Project Implementation Methods

Once a conservation, augmentation, or monitoring project has been selected to receive monies from the fund, the method that will be used to implement the project will depend on the type of applicant. If the project is to be implemented by a private entity, the Department will either allocate the money through a grant contract to the entity proposing the project or seek bids from private contractors under the provisions of Arizona's Procurement Code. A.R.S. § 41-2501, *et seq*. If bids are sought, all bids received by the advertised deadline will be evaluated by the Department. A contract will then be executed with that entity whose bid best meets the applicable contract guidelines. All grant contracts contain enforceable performance provisions to ensure high quality and timeliness of products and deliverables. If the project is to be implemented by a public agency, board, or commission, the Department will either allocate the money to the entity through a grant contract or execute an IGA pursuant to A.R.S. § 11-952. If the project is to be implemented by the Department, monies will be withdrawn from the fund for payment of the costs of the project as they accrue.

General master contracts may be developed in the third management period similar to the technical services contract that was established in the second management period for recharge related studies and projects. For projects that require technical expertise or other services beyond the scope provided by the general services contractors, the Arizona Department of Administration RFP process can be used.

9.7 FUTURE PROGRAM DIRECTION

There are several issues that affect the future of the WMAP including reduced program funding, the Department's changing planning and management priorities, and research and assistance needs identified by the community and the Department.

9.7.1 Reduced Program Funding

Due to the establishment of the Arizona Water Banking Authority in 1996, the conservation assistance, augmentation assistance, and monitoring programs will have less funding available for financial assistance during the third management period. Estimates are that revenues collected for augmentation, conservation, and monitoring programs will drop from approximately $500,000 per year to $150,000 per year beginning in 1998.

The prospect of reduced funding presents a challenge to meet the growing need to develop recharge projects, to evaluate new approaches to implementing conservation assistance programs, and to provide assistance to resolve technical obstacles or issues related to augmentation and recharge.

The Department will continue to participate in financial or in-kind partnerships with other agencies, municipalities, businesses, and utilities. This participation will allow the Department to continue to promote conservation, augmentation, and monitoring activities with fewer funds available. The Department may also need to look to other sources of funding, such as legislative appropriations for special studies and projects. The AMA may need to reevaluate the level of assistance it has provided in the past and focus primarily on providing seed money for projects and target funds to low-cost demonstration or feasibility projects with regional and transferable benefits or projects that address high-priority local water management problems. The Department could direct funds towards a very limited number of priority projects and defer grant disbursal in some years in order to build up sufficient funds to support key projects.

Staff positions in the AMA funded from WMAP funds have been critical to the success of the program by providing program administration, direct conservation assistance to regulated water users, facilitation of regional planning efforts, technical assistance, conservation information exchange and education, and facilitation of cooperatively funded efforts. The AMA will need to evaluate future program expenditures in the context of program staffing needs.

9.7.2 Relationship of Assistance Programs to AMA Program Goals and Planning Efforts

As the Department continues its efforts to facilitate increased utilization of renewable water supplies in concert with water conservation, funds could be allocated to promote the goals and objectives of its regulatory programs. The "Future Directions" sections of chapters 4, 5, 6, 7, and 12 identify specific needs that could be addressed with assistance funds. These research and assistance needs are summarized in this section.

The municipal, agricultural, and industrial programs all demonstrate the need for assistance in expanding utilization of renewable water supplies and for funds for continued conservation assistance and education as described below.

- Municipal program needs include evaluation of the effectiveness of conservation programs and funding of programs that result in significant long-term savings. This may involve focusing funds on conservation research or evaluation projects and implementation programs.

- Agricultural program needs include irrigation water management assistance to farmers, installation of efficient irrigation systems and infrastructure to convey renewable supplies to farms. Other agricultural needs are monitoring crop and water use patterns, and evaluating the impact of market conditions and regulatory programs on farming operations.

- Industrial needs include developing opportunities and planning assistance for renewable supply use. For turf-related facilities, research needs include evaluation of the application rate and of new irrigation technologies. For cooling towers, needs include further research on the impact of effluent and CAP water on cooling tower operation, the use of blowdown water for irrigation, and further investigation of cooling tower maintenance technologies.

9.7.3 Conservation Assistance Program

The Department will continue to strengthen its commitment to conservation through outreach activities in the third management period. All sectors have the potential for further conservation savings, and ongoing education is essential to maintaining and enhancing conservation efforts. As AMA funds diminish, other sources of funding may be needed to supplement the conservation assistance funds or multi-AMA efforts may be developed. On a local or statewide basis, an outreach program could include a media campaign (TV/Radio Public Service Announcements), a Department Conservation and Augmentation Newsletter and an expanded Web site. Research is needed on residential exterior water use and conservation measures and on predicting the success of potential conservation programs. Continuing efforts to promote cooperative regional water conservation programs are necessary in order to reach the widest audience at the lowest cost possible.

9.7.4 Augmentation Assistance Program

In the second management period the Department, the Regional Recharge Committee, and the GUAC identified several general and specific project priorities to facilitate recharge of alternative water supplies. During the third management period, the Department will continue to define project priorities with the assistance of the GUAC and possibly other advisory groups. Chapter 8 identified many institutional, economic, and regulatory factors that influence the ability of area water users to obtain and store or directly use renewable supplies. Because many of these factors will change over time, the specific priorities for project selection are likely to change during the third management period.

During the third management period, the Department may choose to adjust its funding mechanism to fit project priorities and needs. For example, the Department could initiate another grant cycle, in addition to the current process for augmentation assistance, as a means to generate innovative project concepts from a wide variety of sources.

Some of the second management period augmentation assistance program contracts were for activities that are part of longer-term regional efforts. This may result in follow-up activities by the Department during the third management period. One example is continued evaluation and development of a conveyance project to bring CAP water south from the CAP terminus to water users in the Green Valley-Sahuarita area. There is also interest in a further, targeted, cost-effective study of the implications of proposed new stricter federal drinking water standards for disinfection by-products on the design and operation of surface water recharge and recovery operations. The Department could continue to facilitate dissemination of new data and study results into the third management period. If there is ongoing support for the Cañada del Oro project by the project sponsors, and the project continues to meet water management objectives of the AMA, the Department could provide further assistance. Such activities may include participation in the Northwest Augmentation Program, regional planning, review of plans and reports, and coordination support.

9.7.5 Monitoring and Assessment Program

Monies in the WMAP fund allocated for monitoring projects will be used to support a better understanding of the aquifer and the impact of groundwater depletion on surface subsidence. Funds could be used to support development of the hydrologic model for the Tucson AMA that would aid in evaluating impacts on groundwater movement, mining, recharge, and volumes in storage. Monitoring and assessment activities are also critical to developing water management strategies that take more localized water conditions into account and in the revision of the well spacing and impact rules. More information is critical to effectively manage the groundwater resource through development of augmentation and conservation strategies.

APPENDIX 9A
1992 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number – Grantee	Funding Amount
CA92TUE03-00 (INFO/ED) Arizona Department of Water Resources, Tucson AMA–Produced the Second Management Plan Conservation Requirements Brochure.	$1,503.32
CA92TUE05-00 (INFO/ED) Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist II–Position and Equipment. Funds a full-time conservation assistance employee in the Tucson AMA whose main objective is to assist the regulated community in meeting their conservation targets.	$25,798.54 Salary/ benefits /expenses
CA92TUE(M)08-00 (MUNI) Community Water of Green Valley, Green Valley Water Company, and Las Quintas Serenas Water Company–Assisted water companies serving the Green Valley area in implementing a unified water conservation program by conducting an educational campaign and residential interior water audits and plumbing retrofits.	$6,500.00
CA92TUM-IGA (MUNI) Arizona Department of Water Resources, Tucson AMA–Provided tuition to a two day water audit training workshop for 12 irrigators from large turf facilities (golf courses, parks and schools) located within the Tucson AMA but outside the Tucson Water service area. The Department worked in conjunction with Tucson Water's existing turf irrigation training program. Funds were also provided to purchase an irrigation audit kit to allow Tucson AMA staff to conduct audits or loan the kit to interested irrigators within the AMA.	$3,271.88
Total 1992 Expenditures	**$37,073.74**

APPENDIX 9A
1993 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number – Grantee	Funding Amount
CA93TUA20-00 (AG) Pima Natural Resource Conservation District (NRCD) Irrigation Conservation Assistance Program (ICAP)–Assisted farmers with irrigation scheduling and water management techniques in order to reduce agricultural water use while maintaining crop yields.	$36,000.00 Year 1
CA93TUE05-00 (INFO/ED) Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist II–Position and Equipment. Funded a full-time conservation assistance employee in the Tucson AMA to assist the regulated community in meeting their conservation requirements.	$33,826.61 Salary/ benefits /expenses
CA93TUE07-00 (INFO/ED) Bear Essential News for Kids, HydroSmarts Program– Educated grades 1-8 on water conservation through the monthly "HydroSmarts" program in a children's newspaper.	$8,900.00 Year 1
CA93TUI03-00 (IND) University of Arizona, Plant Sciences– Determined the effect of water application rates on the visual quality and health of low and high traffic (compacted) turf areas. Multiple crop coefficients (from weather based evapotranspiration model) and multiple irrigation scheduling techniques were used.	$10,000.00
CA93TUI06-00 (IND) Southern Arizona Innkeepers Association–Funding was provided to conduct professional interior and exterior water audits at two commercial lodging facilities.	$4,000.00
CA93TUM15-00 (MUNI) Tucson Unified School District (TUSD)–Quantified the value of applied water audit training at six comparable TUSD school sites using both potable and reclaimed water systems with separate irrigation meters over a two year period.	$8,250.00 Year 1
Total 1993 Expenditures	**$100,976.61**

APPENDIX 9A
1994 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number - Grantee	Funding Amount
CA94TUA20-00 (AG) Pima Natural Resource Conservation District (NRCD) Irrigation Conservation Assistance Program (ICAP)–Assisted farmers with irrigation scheduling and water management techniques in order to reduce agricultural water use while maintaining crop yields.	$36,000.00 Year 2
CA94TUE02-01 (INFO/ED) University of Arizona, Arizona Water Education for Teachers (WET)–Provided K-6 educators, youth group leaders, museum staff and others who work with youth with information on past and present water use in the AMAs to foster an awareness of AMA specific water issues through design and construction of a unique, area specific, water conservation maze.	$3,717.00
CA94TUE05-00 (INFO/ED) Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III– Position and Equipment. Funded a full-time conservation assistance employee in the Tucson AMA to assist the regulated community in meeting their conservation requirements.	$35,868.46 Salary/ benefits /expenses
CA94TUE01-00 (INFO/ED) Bear Essential News for Kids, HydroSmarts Program–Educated grades 1-8 on water conservation through the monthly "HydroSmarts" program in a children's newspaper.	$10,000.00 Year 2
CA94TUI03-00 (IND) University of Arizona, Plant Sciences–Determined the effect of water application rates on the visual quality and health of low and high traffic (compacted) turf areas. Multiple crop coefficients (from weather based evapotranspiration model) and multiple irrigation scheduling techniques were used.	$10,000.00
CA94TUM15-00 (MUNI) Tucson Unified School District (TUSD)–Quantified the value of applied water audit training at six comparable TUSD school sites using both potable and reclaimed water systems with separate irrigation meters over a two year period.	$8,250.00 Year 2
Total 1994 Expenditures	**$103,835.46**

APPENDIX 9A
1995 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number – Grantee	Funding Amount
CA95TU(E)A05-00 (AG) SWCA, Inc. Environmental Consultants–Prepared the script and story board for a bilingual (Spanish and English) instructional video on uniform and efficient irrigation for agricultural irrigators.	$12,000.00 Year 1
CA95TUA20-00 (AG) Pima Natural Resource Conservation District (NRCD) Irrigation Conservation Assistance Program (ICAP)–Assisted farmers with irrigation scheduling and water management techniques in order to reduce agricultural water use while maintaining crop yields.	$36,000.00 Year 3
CA95TUE04-00 (INFO/ED) Arizona Hydrological Society–Prepared a hydrology curriculum for 5th-8th graders, sponsored a career day for elementary school teachers and students, and constructed 200 "hands-on" groundwater models for use in local schools.	$5,100.00
CA95TUE05-00 (INFO/ED) Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III– Position and Equipment. Funded a full-time conservation assistance employee in the Tucson AMA to assist the regulated community in meeting their conservation requirements.	$38,451.40 Salary/ benefits /expenses
CA95TUE17-00 (INFO/ED) University of Arizona, Water Resources Research Center–Developed an interactive multi-media database on CD-ROM of Xeriscape™ plants for the desert Southwest entitled "Desert Landscaping, Plants for a Water-Scarce Environment."	$20,091.00
CA95TUE18-04 (INFO/ED) University of Arizona, Office of Arid Lands Studies–Upgraded educational displays at Casa del Agua and provided part-time staffing to accommodate group tours and regional outreach and promotion of local water-related programs and information.	$15,250.00 Year 1
CA95TUE20-00 (INFO/ED) Bear Essential News for Kids, HydroSmarts Program–Educated grades 1-8 on water conservation through the monthly "HydroSmarts" program in children's newspaper.	$10,920.00 Year 3
CA95TUI03-00 (IND) Arizona Sonora Desert Museum–Devised and constructed water conservation strategies including sub-metering and public displays on water conservation at the Desert Museum.	$4,800.00
CA95TU(E)I16-00 (IND) Pima Community College–Developed a video and manual to train present and future facility managers and cooling tower operators on efficient cooling tower operation with a focus on conserving water.	$9,330.00
CA95TU(M)I14-00 (IND) University of Arizona, Ag/Biosystems Engineering–Tested ease of use and reliability of a device developed by the Grantee, called the "over-watering controller," for schools, parks, homes and commercial facilities. The savings of irrigation water at the study sites resulting from installing the over-watering controllers was determined by comparison with control sites to determine the number of times irrigations were skipped.	$11,074.00 Year 1

APPENDIX 9A
1995 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number – Grantee	Funding Amount
CA95TUM01-00 (MUNI) Metropolitan Domestic Water Improvement District (MDWID)–Provided funding for additional customers to participate in MDWID's toilet rebate program for replacement of high volume toilets with 1.6 gallon per flush toilets to help reduce water consumption in the District.	$10,000.00
CA95TUM06-00 (MUNI) Dan Dorsey–Developed and constructed two types of low-cost, easily assembled water cisterns to allow residential water customers to collect and store rainwater from their roof surfaces for later use on their landscapes.	$975.00
CA95TU(E)M07-00 (MUNI) University of Arizona, Cooperative Extension, Low 4–Provided maintenance and repair training for school district turf irrigators. Each workshop was tailored to meet the needs of individual Tucson AMA school districts.	$10,000.00
CA95TU(E)M08-00 (MUNI) University of Arizona, Cooperative Extension, Low 4–Provided exterior water conservation "Smartscape" workshops for professionals and "Water$mart" workshops for homeowners. Smartscape is a training program for nursery and landscape professionals designed to encourage horticultural practices consistent with water conservation objectives in the Tucson AMA. Water$mart is a program of free workshops offered throughout the Tucson AMA and designed to reduce residential landscape water use.	$28,781.00 Year 1
CA95TU(E)M10-00 (MUNI) City of Tucson, Tucson Water–Developed a unified regional summer water conservation message in video format to be promoted by southern Arizona water companies.	$10,000.00
Total 1995 Expenditures	**$222,772.40**

APPENDIX 9A
1996 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number – Grantee	Funding Amount
CA96TU(E)A05-00 (AG) SWCA, Inc. Environmental Consultants–Produced a bilingual (Spanish and English) training video on uniform and efficient irrigation for agricultural irrigators.	$9,680.00 Year 2
CA96TUA24-00 (AG) Pima Natural Resource Conservation District (NRCD) Irrigation Conservation Assistance Program (ICAP)–Assisted farmers with irrigation scheduling and water management techniques in order to reduce agricultural water use while maintaining crop yields.	$36,000.00 Year 4
CA96TUE05-00 (INFO/ED) Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III–Position and Equipment. Funded a full-time conservation assistance employee in the Tucson AMA to assist the regulated community in meeting their conservation requirements.	$41,649.09 Salary/ benefits /expenses
CA96TUE17-00 (INFO/ED) University of Arizona, Water Resources Research Center– Developed three interactive, touch screen kiosks for use with the Desert Landscaping CD ROM (CA95TUE17-00) in the Tucson AMA.	$16,032.00
CA96TUE18-00 (INFO/ED) University of Arizona, Office of Arid Lands Studies –Upgraded educational displays at Casa del Agua and provided part-time staffing to accommodate group tours and a school outreach program.	$16,037.00 Year 2 unspent field trip funds carried over to 1997
CA96TUE20-00 (INFO/ED) Kids View Communications/Bear Essential News for Kids–Educated grades 1-8 on water conservation through the monthly "HydroSmarts" program in a children's newspaper.	$11,855.00 Year 4
CA96TUE61-00 (INFO/ED) University of Arizona, Project Water Education for Teachers (WET)–Provided funding for National Project WET teacher training throughout the Tucson AMA.	$3,739.00
CA96TUE62-00 (INFO/ED) University of Arizona, Project Water Education for Teachers (WET)–Provided financial support for maintaining and transporting the water conservation maze (CA94TUE02-01) to schools and provided a cooperative outreach component for water education resources.	$6,452.00 Year 1
CA96TUE63-00 (INFO/ED) University of Arizona, Coop. Extension, Low 4–Produced a water harvesting booklet explaining simple and complex water harvesting techniques for residential and commercial buildings.	$5,000.00
CA96TUE65-00 (INFO/ED) SAWARA–Produced a 15 minute video "Our Water, Our Choice: The Tucson Basin and its Future" promoting increased awareness of Tucson AMA water supply, demand, natural and artificial recharge, subsidence and general hydrologic principles for use by staff, educators, media and service groups.	$25,000.00
CA96TUE68-00 (INFO/ED) Tucson Resource Center for Environmental Education (TREE)–Developed and printed a K-12 teachers resource guide "Water Education Curricula: A Compendium of Resources Specific to Tucson and Southern Arizona" and a regional water education outreach plan.	$5,300.00

APPENDIX 9A
1996 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number – Grantee	Funding Amount
CA96TUE69-00 (INFO/ED) Arizona Sonora Desert Museum–Developed and published a booklet entitled "Desert Waters" and designed related displays on water conservation at the Desert Museum (2 year project).	$28,985.00 2 year funding
96TUI01-00 (IND) Arizona Department of Water Resources, Tucson AMA–Evaluated conservation potential and the potential for CAP utilization at metal mines in the Tucson AMA. Matching funds provided through the Department's General Fund were used to support the consultant's study.	$20,648.00
CA96TU(M)I14-00 (IND) University of Arizona, Ag/Biosystems Engineering–Tested ease of use and reliability of a device developed by the Grantee, called the "over-watering controller," for schools, parks, homes and commercial facilities. The savings of irrigation water at the study sites resulting from installing the over-watering controllers was determined by comparison with control sites to determine the number of times irrigations were skipped.	$10,128.00 Year 2
CA96TU(E)M11-00 (MUNI) University of Arizona, Coop. Extension, Low 4–Developed and produced a brochure for developers focusing on water saving design, equipment/technology, greywater, etc.	$10,000.00
CA96TU(E)M12-00 (MUNI) Pioneer Plumbing–Installed and monitored water savings from waterless urinals in schools and public buildings in comparison to standard flush urinals.	$17,100.00
CA96TUM51-00 (MUNI) MDWID–Provided funding for a low flow toilet (1.6 gal) and faucet aerator rebate program to reduce groundwater use by District customers.	$14,616.54
CA96TUM53-00 (MUNI)–Avra Water Co-op Inc.–Provided retrofit devices for a customer plumbing retrofit and home audit program.	$7,380.00
CA96TUM54-00 (MUNI)–Town of Oro Valley Water Utility–Developed and printed a brochure on regional water supply, demand and conservation opportunities to serve as a companion piece to the video on Tucson water resources "Our Water, Our Choice: The Tucson Basin and its Future."	$2,000.00
CA96TU(E)M58-00 (MUNI) University of Arizona, Coop. Extension, Low 4–Provided exterior water conservation "Smartscape" workshops for professionals and "Water$mart" for homeowners. Smartscape is a training program for nursery and landscape professionals designed to encourage horticultural practices consistent with water conservation objectives in the Tucson AMA. Water$mart is a program of free workshops offered throughout the Tucson AMA and designed to reduce residential landscape water use.	$22,362.00 Year 2
Total 1996 Expenditures	**$309,963.63**

APPENDIX 9A
1997 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number – Grantee	Funding Amount
CA97TUA24-00 (AG) Pima Natural Resource Conservation District (NRCD) ICAP–Assisted farmers with irrigation scheduling and water management techniques in order to reduce agricultural water use while maintaining crop yields.	$18,000.00 Year 5
CA97TUA26-00 (AG) Westland Resources, Inc.–Developed an effluent utilization plan, environmental analysis, preliminary design and cost estimates for delivery of effluent to the Avra Valley Irrigation District and Cortaro Marana Irrigation District.	$23,670.00
CA97TUE05-00 (INFO/ED) Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III–Position and Equipment. Funded a full-time conservation assistance employee in the Tucson AMA to assist the regulated community in meeting their conservation requirements.	$38,101.91 Salary/ benefits /expenses
CA97TUE18-00 (INFO/ED) University of Arizona, Office of Arid Lands Studies–Upgraded educational displays at Casa del Agua and provided part-time staffing to accommodate group tours and regional outreach and promotion of local water related programs and information.	$14,782.00 Year 3
CA97TUE20-00 (INFO/ED) Kids View Communications/Bear Essential News for Kids–Educated grades 1-8 on water conservation through the monthly "HydroSmarts" program in children's newspaper.	$10,920.00 Year 5
CA97TUE62-00 (INFO/ED) University of Arizona, Project Water Education for Teachers (WET)–Provided support for the water conservation maze and cooperative outreach component for area resources for water education.	$6,452.00 Year 2
CA97TUE70-00 (INFO/ED) City of Tucson, Stormwater Section–Developed and provided educational materials highlighting water harvesting at the City's Southeast Branch Library and Educational Resource Center.	$11,700.00
CA97TUI16-00 (IND) University of Arizona, Ag/Biosystems Engineering–Provided funding for a research project to determine whether sub-surface drip irrigation is a viable water conservation option on turf using reclaimed water.	$11,288.00 Year 1
CA97TUI19-00 (IND) University of Arizona, Environmental Research Lab–Developed best management practices for the reuse of high-TDS cooling tower blowdown water on trees, shrubs and groundcovers typically planted in landscapes near large cooling towers in the Tucson area.	$14,960.00 Year 1
CA97TUM58-00 (MUNI) University of Arizona, Coop. Extension, Low 4–Provided funding for two exterior water conservation "SmartScape" workshop series for professionals and 30 "Water$mart" workshops for homeowners.	$22,362.00 Year 3
CA97TUM80-00 (MUNI) City of Tucson, Tucson Water–Provided funding to develop a landscape water budget methodology and support materials for distribution through the Zanjero Program that provides residential water audits to Tucson Water customers. (Cancelled at grantees request)	$3,006.00

APPENDIX 9A
1997 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number – Grantee	Funding Amount
CA97TUM82-00 (MUNI) Tucson Unified School District (TUSD)–Implemented a pilot central irrigation controller system for water conservation and irrigation management at TUSD schools.	$3,337.00
CA97TUM83-00 (MUNI) University of Arizona, Water Resources Research Center–Evaluated water providers' service areas to determine what residential exterior water conservation measures would be most effective for individual service areas and looked for opportunities for providers to cooperatively develop conservation programs.	$13,255.00
CA97TUM85-00 (MUNI) Arizona Department of Water Resources, Tucson AMA–Evaluated the water conservation potential of horizontal axis (tumble action, front loading) washing machines within the Tucson AMA through a feasibility/market research study.	$1,642.67 Year 1
CA97TUM87-00 (MUNI) University of Arizona, Coop. Extension, Low 4–Funded a irrigation system analyst position in the Low 4 Office to provide irrigation system evaluations to water providers in the Tucson AMA (outside the Tucson Water service area) of large residential, multifamily, and commercial turf facilities.	$35,018.00
Total 1997 Expenditures	**$228,493.58**

APPENDIX 9A
1998 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number-Grantee	Funding Amount
CA98TUA24-00 (AG) Pima Natural Resource Conservation District (NRCD) Irrigation Conservation Assistance Program (ICAP)– Assisted farmers with irrigation scheduling and water management techniques in order to reduce agricultural water use while maintaining crop yields.	$36,000.00 Year 6
CA98TUE05-00 (INFO/ED) ADWR, TAMA–Water Resource Specialist III-Position & Equipment. Funded a full time conservation assistance employee in the Tucson AMA to assist the regulated community in meeting their conservation requirements.	$38,101.91 Salary/ benefits /expenses
CA98TUE18-00 (INFO/ED) University of Arizona Office of Arid Lands Studies– Upgraded educational displays at Casa del Agua and provided part-time staffing to accommodate group tours and regional outreach and promotion of local water related programs and information.	$10,000.00 Year 4
CA98TUE20-00 (INFO/ED) Kids View Communications/Bear Essential News for Kids–Educated grades 1-8 on water conservation through the monthly "HydroSmarts" program in children's newspaper.	$11,340.00 Year 6
CA98TUE71-00 (INFO/ED) Environmental Education Exchange–Developed water conservation education materials for use by middle school students.	$8,000.00
CA98TUE72-00 (INFO/ED) The League of Women Voters of Greater Tucson Produced and distributed a fact sheet on the issues raised by CAP water recharge.	$2,000.00
CA98TUI16-00 (IND) U of A - Ag/Biosystems Engineering–Determined whether sub-surface drip irrigation using reclaimed water is a viable water conservation option on turf.	$16,269.00 Year 2
CA98TUI19-00 (IND) U of A Environmental Research Lab–Developed best management practice for the reuse of high-TDS cooling tower blowdown water on trees, shrubs and groundcovers typically planted in landscapes near large cooling towers in the Tucson area.	$14,947.00 Year 2
CA98TUM58-00 (MUNI) U of A Coop. Extension, Low 4–Provided funding for two exterior water conservation "Smartscape" workshop series for professionals and 15 "Water Smart" workshops for homeowners.	$23,134.00 Year 4

APPENDIX 9A
1998 CONSERVATION ASSISTANCE GRANT EXPENDITURES
TUCSON ACTIVE MANAGEMENT AREA

Grant Number - Grantee	Funding Amount
CA98TUM85-00 (MUNI) ADWR, Tucson AMA–Developed and implemented an educational/ media campaign and possible rebate or incentive program to encourage the use of horizontal axis washers that save 40% of the water used by standard washers.	$ 15,358.33 Year 2 includes carry over of $ 5,358.33 in unspent funds from year one
CA98TUM90-01, (MUNI), U of A, P.C. Coop Extension/Low 4 Program Developed three new workshops for the Water Smart series on water harvesting, hands on drip irrigation installation and low water use plant selection.	$11,050.00
CA98TU(E)M92-00 (MUNI) WestLand Resources, Inc. Developed a "step by step" guide that will allow a homeowner to easily design and permit a residential greywater system in Pima County.	$5,490.00
CA98TUM94-00 (MUNI) U of A Water Conservation Alliance of So. Arizona Assessed the current use of residential greywater in terms of water quality, water savings and additional conservation potential. Determined whether current regulations can be simplified to enable greater use of greywater to reduce groundwater use outdoors.	$15,295.00
Total 1998 Expenditures	**$206,985.24**

APPENDIX 9B
AUGMENTATION PROGRAM EXPENDITURES 1987-1999
GRANTS, CONTRACTS, IGAs, AND LEGISLATIVE INITIATIVES
TUCSON ACTIVE MANAGEMENT AREA

Grant/Contract Number – Grantee/Consultant	Funding Amount
IGA Arizona Department of Water Resources, Tucson AMA–A cooperative project initiated by the Department with Pima County Flood Control District and Tucson Water to develop a multi-source recharge facility in the Swan to Craycroft reach of the Rillito. Original concept incorporated (1) increased flood storage, (2) enhanced recharge of runoff water, (3) artificial recharge of CAP water and effluent, and (4) recreational and interpretive components. **Phase A**–Feasibility of the Rillito Recharge Project was effective from August 18, 1987 to December 31, 1989. **Phase B**–The second IGA between City of Tucson, Pima County Flood Control District, and the Department, effective from May 28, 1991 to December 31, 1992, combined the participants' resources to fund a separate contract between the Department and CH2M Hill to complete the Phase B activities. Under this phase, two conceptual designs were developed for the project, one using CAP water, reclaimed water and storm water, and the second using only storm water.	$173,933.43
1990-1993 Santa Cruz Valley Water District (originally named the Tucson AMA Water Augmentation Authority)–The Tucson AMA Water Augmentation Authority was authorized by adoption of Senate Bill 1556 to assist in the effort to attain safe-yield for the Tucson AMA. The Authority was later renamed the Santa Cruz Valley Water District as part of legislative amendments passed in 1992.	$798,190.00
TUCAUG94-2-2 Sahuarita Unified School District–Conducted a feasibility study to evaluate replacing the School District's current wastewater leaching system with a constructed wetland system.	$24,550.00
TUCAUG94-4-1 Metropolitan Domestic Water Improvement District–TUCAUG94-4B, Assessed the feasibility of recharging CAP water within the Cañada del Oro (CDO) drainage basin. Technical assessments of recharge feasibility were performed for recharge basins at the proposed Big Wash and Oasis recharge sites and within the channel of the nine-mile-long reach of the CDO Wash between the sites.	$21,250.00
Fiscal Year 1995 Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III–Funded a full-time augmentation assistance employee to facilitate augmentation and use of renewable water supplies within the Tucson AMA.	$10,256.21 Salary/benefits /expenses

APPENDIX 9B
AUGMENTATION PROGRAM EXPENDITURES 1987-1999
GRANTS, CONTRACTS, IGAs, AND LEGISLATIVE INITIATIVES
TUCSON ACTIVE MANAGEMENT AREA

Grant/Contract Number – Grantee/Consultant	Funding Amount
AUGTU95-1 Pima County Flood Control District–Conducted a study to determine the recharge suitability of near-surface soils at the Lower Santa Cruz River (LSCR) site and the suitability of the vadose zone at the Cañada Del Oro (CDO) site to transmit recharged water. Determined the chemical compatibility of CAP water with the alluvial deposits and aquifer underlying the LSCR and CDO sites, and treated effluent with the alluvial deposits and aquifers underlying the LSCR site.	$296,000.00
AUGTU95-2 Tucson Unified School District (TUSD)–Study and report on the feasibility of converting the irrigation systems from a potable groundwater source to a reclaimed water source at twelve TUSD schools.	$15,000.00
AUGTU95-3 Metropolitan Domestic Water Improvement District–Collected data on groundwater storage conditions in the Lower Cañada Del Oro (CDO) basin to allow local water users to better assess groundwater augmentation needs. Provided information about primary areas that are conducive to artificial recharge and rates of recharge along the CDO Wash.	$53,500.00
AUGTU95-4 BKW Farms–Removal and construction of 9,400 feet of ditch pad and lining to increase the capacity of irrigation ditches and laterals. Allows for the delivery of greater volumes of CAP water to agricultural lands owned by the grantee in Avra Valley.	$51,700.00
Fiscal Year 1996 Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III– Funded a full-time augmentation assistance employee to facilitate augmentation and use of renewable water supplies within the Tucson AMA.	$33,401.88 Salary/benefits /expenses
Fiscal Year 1997 Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III– Funded a full-time augmentation assistance employee to facilitate augmentation and use of renewable water supplies within the Tucson AMA.	$32,810.31 Salary/benefits /expenses
Fiscal Year 1997 Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III– Funded a temporary, full-time planner devoted to facilitate regional recharge activities within the Tucson AMA.	$29,180.15 Salary/benefits /expenses
A7-0093 Malcolm Pirnie, Sahuarita, Green Valley Area CAP Water Use Feasibility Analysis and Delivery System Optimization Study–The study scope was developed by the USCWUG and the Department to assess the feasibility of delivering CAP water from the CAP Terminus to users in the Sahuarita-Green Valley area. The study included an assessment of projected water use needs; an assessment of feasible routes and a conceptual design of nine alignment segments; an optimization of the system to deliver the most CAP water at least cost to area water users; a preliminary design of the optimal system; and financial analysis of project costs. The data may be used by USCWUG as the basis for further work to develop the project.	$296,995.00

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AUGMENTATION PROGRAM EXPENDITURES 1987-1999
GRANTS, CONTRACTS, IGAs, AND LEGISLATIVE INITIATIVES
TUCSON ACTIVE MANAGEMENT AREA

Grant/Contract Number – Grantee/Consultant	Funding Amount
A7-0077-005-97-2220 GeoSystems Analysis, Inc., Disinfection By-Product Issues Study–Through literature review and interviews, with input from an advisory committee, the consultant investigated disinfection by-products (DBP) and DBP precursors as affected by the recharge and recovery of CAP water. The consultant summarized relevant information about the organic quality of CAP water served in the Tucson AMA, DBP transport and fate mechanisms, water quality management, and contributions by algal blooms. They also identified and prioritized data gaps; identified opportunities for cooperative studies and outside funding; and recommended a strategy to address water providers' research needs. Sixty copies of the April 29, 1998 final report were distributed.	$21,160.00
Fiscal Year 1998 Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III–Funded a full-time augmentation assistance employee to facilitate augmentation and use of renewable water supplies within the Tucson AMA.	$38,644.09 Salary/benefits /expenses
Fiscal Year 1998 Arizona Department of Water Resources, Tucson AMA–Water Resource Specialist III–Funded a temporary, full-time planner devoted to facilitate regional recharge activities within the Tucson AMA.	$19,663.25 Salary/benefits /expenses
IGA-99-2256 Town of Oro Valley and Metropolitan Domestic Water Improvement District. A7-0077-005-99 GeoSystems Analysis, Inc., Cañada del Oro Supplemental Recharge Feasibility Investigation–A cooperative project to complete hydrogeological investigations of the proposed Cañada del Oro Recharge and Recovery Project site. Variably saturated flow modeling will be used to simulate recharge in lieu of conducting a pilot test. Sonic drilling to obtain continuous cores; detailed mapping, sampling and analysis of surface outcrops; permeability testing; and geostatistical analysis of surface and borehole data are being used to characterize key parameters.	$250,000.00
IGA 99-2267 Agreement No. 3 United States Geological Survey, The Development of Methods to Estimate Groundwater Recharge, Rillito Creek, Tucson, Arizona–A cooperative study to evaluate recharge feasibility along a 12-mile reach of the Rillito Creek between Craycroft Road and the confluence with the Santa Cruz River. Saturated and variably saturated flow models will be developed to simulate the results of several infiltration scenarios.	$317,000.00 thru 3/02
Total of Augmentation Grant/Contract Expenditures	**$2,483,234.34**